8.15 Economics

8.15.1 Introduction

This section addresses a number of aspects within Section 3.10 (Social and Economic Environment – Description of environmental values) of the Terms of Reference ToR, the requirements of which are specified in Section 6.15. This section addresses these requirements in the context of the LNG facility region. This region encompasses the city of Gladstone and the surrounding area of Calliope (effectively the new Gladstone Regional Council area, excluding Miriam Vale).

8.15.2 Methodology

The methodology used to assess the environmental values of the LNG facility region, and the potential impacts of the project on the region are described in sections 6.15.2 and 6.15.5 respectively.

8.15.3 Regulatory Framework

The regulatory framework applicable to the LNG facility region is described in Section 6.15.3.

8.15.4 Existing Environmental Values

8.15.4.1 Regional Economic Profile

The development of heavy industry has made the LNG facility region very different in industrial composition compared to the gas transmission pipeline/CSG fields region. The spread of industries is broad, with manufacturing (22 % of total employment), construction (12 %) and retail trade (11 %) representing the largest industry employers in 2006. While the proportion of people employed in construction and retail trade in the LNG facility region is not dissimilar to the proportion in Queensland as a whole, manufacturing represents a much greater proportion of employment in the LNG facility region (22 % compared to 10 % in Queensland).[1] (see Figure 8.15.1).

8.15.4.2 Project and Industry Context

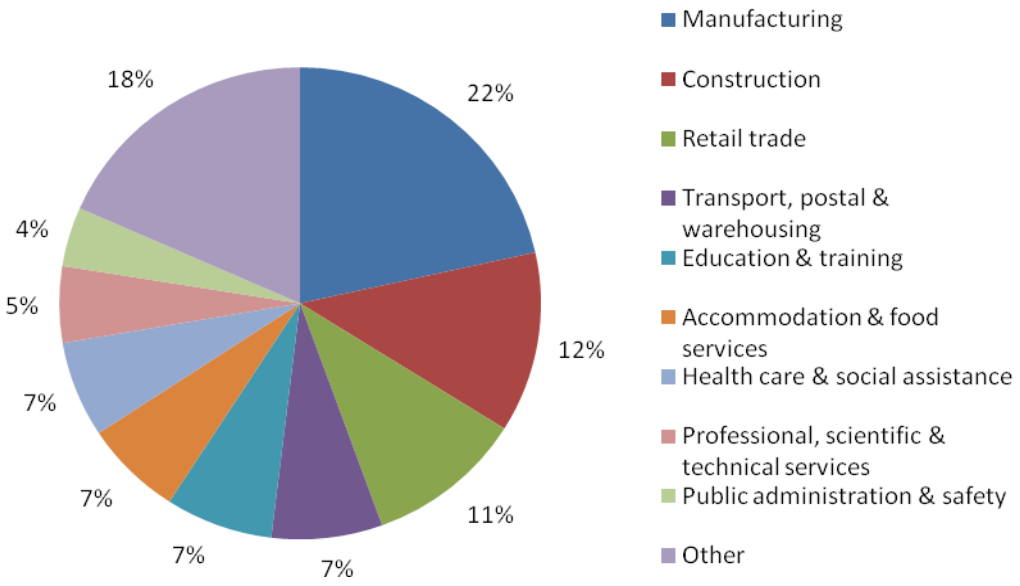
Manufacturing

Manufacturing is an important sector in the Queensland economy. In 2005-06, the manufacturing industry in Queensland employed 201,700 people, almost 19 % of total manufacturing employment in Australia. Industry value-added in 2005-06 was $17,464 million, with $8,575 million paid in wages and salaries. In 2007 the manufacturing sector in Queensland contributed 17 % of total Australian manufacturing gross value-added (ABS, 2007a).

Manufacturing is a particularly important sector in the Central Queensland economy, and the city of Gladstone is its hub. Large-scale manufacturing in the Project area is concentrated around Gladstone, which is promoted as a 'world class location for mineral and resource processing and light metal industries'. [2]

[1] NB. There is a slight statistical discrepancy between these percentages and those in Figure 8.15.1, due to the ABS practice of making data confidential. Those written in the text are more accurate.

[2] .http://www.gladstoneindustry.org.au/gladstone-location-of-choice/overview/



Source: ABS Population Census, 2006.

Figure 8.15.1 LNG facility region employment by industry (%) (2006[3])

The Queensland government has invested heavily in attracting key industries to the area. The Gladstone State Development Area (GSDA) comprises 28,000 ha of land in Gladstone City and Calliope Shire that has been set aside by the Government for large scale industrial development (Gladstone Economic and Industry Development Board, undated).

Examples of manufacturing plants present in and around Gladstone include the world's largest alumina refinery, Australia's largest aluminium smelter, Australia's largest cement kiln, the largest power station in Queensland, and chemical manufacturing plants (Gladstone Economic and Industry Board, undated).

Queensland Alumina Limited (QAL) began production of alumina in Gladstone in 1967 with 600,000 tonnes produced per year. It is now the world's largest alumina refinery, with annual production of 3.95 million tonnes and an average workforce of 1,050 people, plus contractors (Queensland Alumina Limited).

Boyne Aluminium Smelter, Australia's largest aluminium smelter, is located on Boyne Island, 20 km south of Gladstone. It first commenced operation in 1982, and by 2006 its production reached 545,000 tonnes of aluminium per year. Boyne Smelter employs 1,247 employees, plus contractors (Rio Tinto Aluminium, 2008).

Construction

The construction industry across Queensland recorded employment growth of 67 % in the ten years to 2006 (ABS, 2007d). The value of work done across all construction sectors has risen 288 % in the same time period, with the strongest growth occurring in the electricity generation, transmission and pipelines sector (664 %), and the heavy industry sector (454 %). Both the public and private sector are participating in the boom, with the value of work done for the public sector increasing by 232 %, and the value of work done by the private sector for the private sector increasing by 371 % (ABS, 2008a).

As of 2005-06, 773 projects worth over $10 million each were being undertaken or are at the planning stage across the State, with many of these in the Gladstone region. Some of the major projects in the Gladstone/Calliope area include:

[3]The Mining classification includes oil and gas extraction activities

- Wiggins Island coal terminal (development cost $1.8 billion);
- Stage two development of the Rio Tinto alumina refinery (development cost up to $1.4 billion);
- Gladstone Port coal terminal expansion (cost of $420 million); and
- Central Queensland gas pipeline from the Bowen Basin to Gladstone (estimated cost $200 million) (Central Queensland Regional Information System, 2006).

Several LNG processing and export projects are also in the planning stages, with export cargoes of LNG likely to be shipped from Gladstone by 2015. Queensland Gas Company/British Gas, Arrow Energy and Sunshine Gas all have an interest in leading the development of such a processing and export facility in Gladstone. Should any of these go ahead, this will require a significant increase in the construction workforce in Gladstone. Queensland Gas Company, for instance, estimates that it will require 3,000 employees during the construction phase of their LNG facility (Gladstone Economic and Industry Development Board, 2008).

Elsewhere in the project area, the construction industry has benefited from the increasing number of mining projects throughout the Bowen and Surat Basins. Examples of this include the construction of the Bauhinia Regional Rail Line to transport coal from Rolleston to Gladstone (employing approximately 450 construction employees) (Queensland Rail, 2005).

While the exact impact of the global recession on the construction industry in Queensland and in the Gladstone region is uncertain, especially in relation to projects that are currently in the planning phase, the project will at least partially offset any negative growth in the construction industry.

Port of Gladstone

The Port of Gladstone is one of Australia's largest ports and an important contributor to the regional economy. It is Queensland's second largest port by quantity of exports and Australia's sixth largest (BTRE, 2007). Owned by the Queensland Government, the Port provides facilities for shipment of agricultural, mineral and coal exports. Gladstone Ports Corporation (GPC) (formerly Central Queensland Ports Authority) operates the Port and cargo handling facilities and directly employs over 500 people. There are fifteen wharves in the Port, operated by GPC as well as private organisations such as GrainCorp, Queensland Alumina, Boyne Smelters, Rio Tinto, and others (Central Queensland Ports Authority, 2008).

The Port is currently expanding its capacity to handle the increased demand for commodities, particularly coal, being exported from Gladstone. The RG Tanna Coal Terminal has recently been upgraded to increase its capacity from 45 million tonnes per annum (Mtpa) to 70 Mtpa at a cost of $800 million, with final work completed in the first quarter of 2008.

In conjunction with Queensland Rail, GPC is also committed to building a new coal terminal at Wiggins Island at a cost of $1.3 billion for stage one. Construction of the Wiggins Island Coal Terminal is expected to begin between 2009 and 2012, and employ 500 contract staff. It is estimated that 130 new jobs will be created to operate the new terminal (Gladstone Economic and Industry Development Board, 2008).

An assessment of the impact of the Port suggests that in 1999-2000, each ship calling at the Port generated on average $149,000 of value-added and 1.9 full-time jobs for one year in the Fitzroy Statistical Division (SD). It is estimated that 66 % of the total impact in terms of value-added was through coal exports, with other dry bulk exports (such as minerals, woodchips and grain) contributed another 21 % of value-added. In 1999-2000, the Port was estimated to generate 1,758 jobs and $224 million in output (Bureau of Transport Economics, 2001).

Commercial Fisheries

In 2003-04 Queensland contributed 13 % of the gross value of Australia's fisheries production, equal to Tasmania's input, but behind Western Australia (25 %), South Australia (21 %) and the Commonwealth (15 %). As of 2004, 2,868 Queenslanders were estimated to be employed on a full-time basis in the wild catch fishing industry, 612 in aquaculture, and 113 in fish processing. Key species harvested include prawns, barramundi and crabs (ABARE, 2004). In 2006-07, the gross value of production of trawl fishing in Queensland was estimated at $85 million, compared with $105 million for non-trawl and $65 million for aquaculture (Queensland Department of Primary Industries and Fisheries, 2008a).

Gladstone is a home port for both the trawl and net fishing fleets for the fin fish and prawn fisheries (Queensland Government, 2008a). Processing facilities are available in the port. Commercial species harvested include mud crab, prawns, coral trout, mackerel, whiting and scallops (EPA, 2003). The most common fishing activities are trawling, line fishing and crabbing, with many commercial fishing licence holders engaging in a combination of these methods (Fenton and Marshall, 2001).

In 2001 an extensive survey of commercial fishers by the CRC Reef Research Centre concluded that there were approximately 131 commercial fishing licence holders with a home port in the Gladstone region. Another 45 from other home ports use Gladstone as a port facility (Fenton and Marshall, 2001).

During the peak season, each fishing business employed, on average, 2.7 employees, making a total of 354 full time employees. Approximately 80 % of these employees live within the city of Gladstone. It is estimated that the combined value of production of all the fishing businesses in Gladstone was $28.4 million in 2001, or 9 % of the total value of production of the Queensland fishing industry. In addition, fishing businesses spent a total of $14.8 million in Gladstone, and their employees spent 87 % of their annual household expenditure within Gladstone (Fenton and Marshall, 2001).

Tourism and Recreation

Tourism is a significant industry for Queensland as a whole, with internationally renowned tourist destinations such as the Great Barrier Reef attracting large numbers of domestic and international tourists. In the year to June 2004, tourism contributed $8.4 billion to the state economy, or 6 % of GSP. After coal, it is the state's largest export earner, and employs 136,000 people, 80 % of these in small business (Tourism Queensland, 2008a). In spite of a slight decline in its market share of international visitors, Queensland still accounts for one third of all holiday expenditure by international visitors to Australia (Tourism Queensland, 2008b).

Gladstone itself is not known as a tourist destination; however it is a stopover on the route to Heron Island and other islands in the Great Barrier Reef and for car-based tourists travelling through the region. Key attractions and activities in the area include visiting national parks, four-wheel driving, fossicking for gemstones, visiting historical farm properties, fishing, bird-watching and generally enjoying the landscapes of the area. Regional events such as country horse racing, rodeos, and agricultural shows also attract visitors to the area.

There are several national parks in the Gladstone region; for example Cania Gorge National Park, Broadwater Conservation Park and Capricorn Cays National Park, where activities such as bushwalking, snorkelling and camping are popular.

Despite these attractions, most tourists visit Brisbane, the Gold Coast and Tropical North Queensland, with relatively few venturing inland to areas that this project covers. The project area regions of Fitzroy, Outback and Darling Downs combined attracted 9 % of international tourists and 16 % of domestic tourists over the year (Tourism Queensland, 2008a).

Recreational Fishing and Boating

Recreational fishing and boating is a popular pastime across Queensland, with over 200,000 recreational boats registered. Gladstone is the centre of an active recreational fishing and boating community. In Gladstone, there are five fishing clubs and a yacht club. A survey of recreational boaters conducted by

Maritime Safety Queensland in 2006 suggests that 63 % of boaters came from South East Queensland, with 15 % in the Wide Bay region. The most popular boats are dinghies and motorboats/speedboats. When asked about their main boating activities, 84 % of boaters indicated fishing by day, with most users operating the boat in rivers, bays, estuaries and smooth waters (Maritime Safety Queensland, 2007).

Around Gladstone, popular fishing spots include Gladstone Harbour, Calliope River, Farmers Point and Lake Callide in Banana Shire. The region has the second highest recreational fishing catch in Queensland, with between 1.5 and 2 million fish caught in the area in 2000. Prawns and yabbies are the most commonly caught, followed by finfish and baitfish (Fisheries Research and Development Corporation).

8.15.4.3 Labour Force

In 2006, there were 22,025 people employed in the LNG facility region, with an unemployment rate of 5.0 %. This is higher than the Queensland average of 4.7 % (see Table 8.15.1). Labour force participation in the LNG facility region is higher than the Queensland average, suggesting that people have either moved to Gladstone to look for work, or have been drawn to participate in the labour market by the prospect of gaining employment and relatively high wages. Unemployment is also higher than the State average, which may be the obverse of the high participation rate and frictional unemployment as people who are moving into the area or into the labour force look for work.

Both the rate of unemployment in the LNG facility region and in Queensland overall have fallen significantly in the ten years to 2006. In 1996 unemployment in the region was 9 % and in Queensland it was almost 10 %.

The labour force in the LNG facility region has grown strongly since 1996. During the period from 1996 to 2006, the labour force increased by nearly 18 %, from 19,710 to 23,222 people. However this growth is somewhat less than the growth in the Queensland labour force as a whole over the same period, which was 23 %.

Table 8.15.1 Labour force indicators by SLA, LNG Facility Region (1996 and 2006)

SLA	Unemployment rate (%)		Participation rate (%)	
	1996	2006	1996	2006
Calliope (S) - Pt. A	8.6	4.2	63.6	64.1
Calliope (S) - Pt. B	9.0	5.1	61.9	62.4
Gladstone (City)	9.1	5.4	66.9	67.4
Facility average	9.0	5.0	65.7	66.1
Queensland	**9.6**	**4.7**	**61.0**	**61.1**

Source: ABS, 2007c.

Occupations

The labour force of the LNG facility region is characterised by relatively high levels of trade and technical qualifications, but lower levels of university-level qualifications compared with Queensland as a whole. Less-skilled occupations such as machinery operators and labourers are also common (ABS Population Census, 2006).

By occupation, the LNG facility region has a very high proportion of technicians and trades employees (22 %), machinery operators and drivers (13 %) and labourers (13 %). These are higher than the Queensland averages of 15 %, 7 % and 12 % respectively. By contrast, the LNG facility region has lower proportions of professionals, managers, and sales and service employees than the Queensland average (ABS Population Census, 2006).

Education

Education levels in the LNG facility region are slightly higher than in the gas transmission pipeline/CSG fields region. About 34 % of people in the LNG facility region have graduated from Year 12 – like the gas transmission pipeline/CSG fields region, this is lower than the Queensland average of 41 %. The highest level of education for 47 % of the LNG facility region population is Year 10 or less.

In terms of post-school qualifications, the LNG facility region also has a more educated population than the gas transmission pipeline/CSG fields region, but is still lower than the Queensland average. A post-school qualification is held by 48 % of the LNG facility population, compared to 44 % in gas transmission pipeline/CSG fields region and 51 % in Queensland as a whole. Technical training is more common in the LNG facility region, with 23 % of the population holding a Certificate qualification. This is higher than both the gas transmission pipeline/CSG fields region (19 %) and Queensland (18 %). As in the gas transmission pipeline/CSG fields region, a university education is relatively uncommon, with 7 % of the population holding a Bachelor Degree and 1 % holding a Postgraduate Degree.

The Queensland Government currently lists over 50 skilled occupations in high demand in Gladstone. Many of these are in the construction industry, but a high number of occupations provide services to the construction workforce and general community, such as podiatrists, nurses and chefs (Queensland Government, 2008b).

Labour Mobility

Data on labour mobility could not be obtained due to confidentiality constraints; however an indication of labour mobility is the length of time an individual has lived at their current address. For the LNG facility region, 24 % of the population has lived at their current address for one year or less, and 53 % have lived at their current address for less than five years. This reflects higher population mobility than the Queensland average. In Queensland, 21 % of the population have been at their current address for less than one year, and 51 % have been there for less than five years (ABS Population Census, 2006).

Comparison between the two measures used by the ABS to calculate Population Census data also provides an indication of labour mobility. The ABS collects data from individuals based on their location on Census night (place of enumeration), based on their usual place of residence, and based on their place of work. Comparison between place of work and place of usual residence allows some indication of the number of people permanently residing in a location and the number of people who work in that location, but may not live there[4].

For the LNG facility region, the employed resident population overall is higher than the employed working population, by 8.4 %. This suggests that overall, there is a net loss of employees from the LNG facility region, who may work in surrounding regions or further afield. Within the three statistical local areas (SLAs) that make up the LNG facility region, the story is mixed – Gladstone gains 7 % of its workforce, and Calliope Pt B gains 41 % of its workforce from outside the SLA. Calliope Pt A loses 51 % of its employees, many of whom could potentially be working in Gladstone, Calliope B and surrounding areas (ABS Population Census 2006).

Earnings

Individual yearly income in 2003-04 across much of the project area was higher than for Queensland as a whole (ABS, 2007c) (see Table 8.15.2). This is particularly the case in and around Gladstone.

[4] Generally, the Census tends to undercount permanent residents, as some residents, such as those temporarily overseas, are not present on Census night. As a result, estimates of non-resident workforce as a percentage of total workforce may be overstated.

Table 8.15.2 Wage and salary income 2003-04

SLA	Average wage and salary income ($)	Median wage and salary income ($)
Gladstone	45,227	41,483
Calliope – Pt A	45,227	41,445
Calliope – Pt B	44,252	39,532
Queensland	**37,887**	**33,531**

ABS 2007c.

In 2003-04, earnings in particular professions in the Gladstone statistical subdivision (SSD) were significantly higher than elsewhere in the State. This is a reflection of the high demand for these professions in Gladstone, with companies willing to pay above average wages to attract staff. The majority of professions with above-average wages are those in the lower skilled categories, in particular tradespersons, labourers and transport employees.

8.15.5 Potential Impacts and Mitigation Measures

8.15.5.1 General Economic Benefits and Impacts of the Project

The results of the economic impact assessment indicate that the project will generate major net economic benefits for both the Queensland economy and the wider Australian economy and is likely to partially mitigate any downturn in the Australian and Queensland economy.

Economic Importance of the Project: Scenario 1

In summary, the impact on the Queensland economy of the 3 Mtpa project is estimated to be:

- Over the period 2009 to 2033, Queensland's real gross state product (GSP) is on average $1.5 billion or 0.4 % higher each year than in the base case scenario (see Figure 8.15.2).
- This increase in Queensland's real GSP is distributed to households throughout Australia, although Queenslanders benefit proportionately more than other Australians. The project contributes to an average annual increase in Queensland real private consumption spending over the period 2010 to 2033 of $193 million (see Figure 8.15.2). This constitutes a 0.09 % increase over the base case scenario, which is higher than the gain for Australia as a whole (of 0.04 %).
- The project delivers important employment benefits to the Queensland economy and the project regions. On average, employment in Queensland is 1,600 per year higher on a full-time equivalent basis. The total employment (direct and indirect) employment effect is stronger after 2014, indicating that the project has a moderate multiplier effect (see Figure 8.15.2).

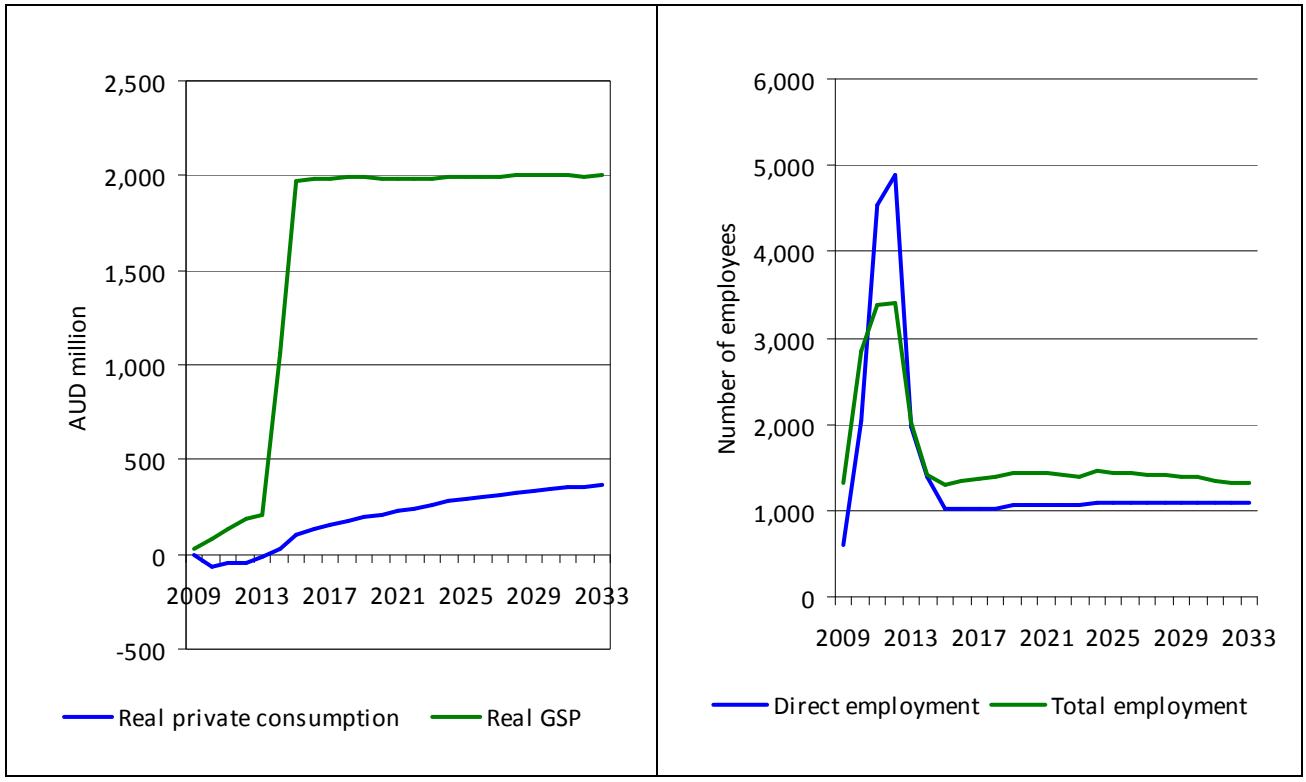


Figure 8.15.2 Impact on the Queensland economy: 3 Mtpa (change compared to the base case scenario)

The impact on the Australian economy (including Queensland) of the 3 Mtpa project is depicted in Figure 8.15.3. In summary:

- Real GDP is, on average, $1.3 billion (or 0.1 %) higher under scenario 1 relative to the base case. Over the life of the project, the net present value of this increase in GDP is estimated to be $12.3 billion.
- The project contributes to an average annual increase in Australian real private consumption spending of $500 million (0.04 %).
- When the facility commences production (2014), the project contributes to an average annual increase in net international exports of $919 million. Over the life of the project contributes to a net increase in export volumes of $662 million.
- The project's total contribution to Australian greenhouse gas (GHG) emissions is estimated to average 2.1 mt CO_2-e/year, equivalent to around 0.3 % of total Australian emissions. This is somewhat lower than the average annual direct emissions of the project of 2.6 Mtpa (see section 6.9) because the economic impact of the project causes output of some other industries in the economy to decline slightly.

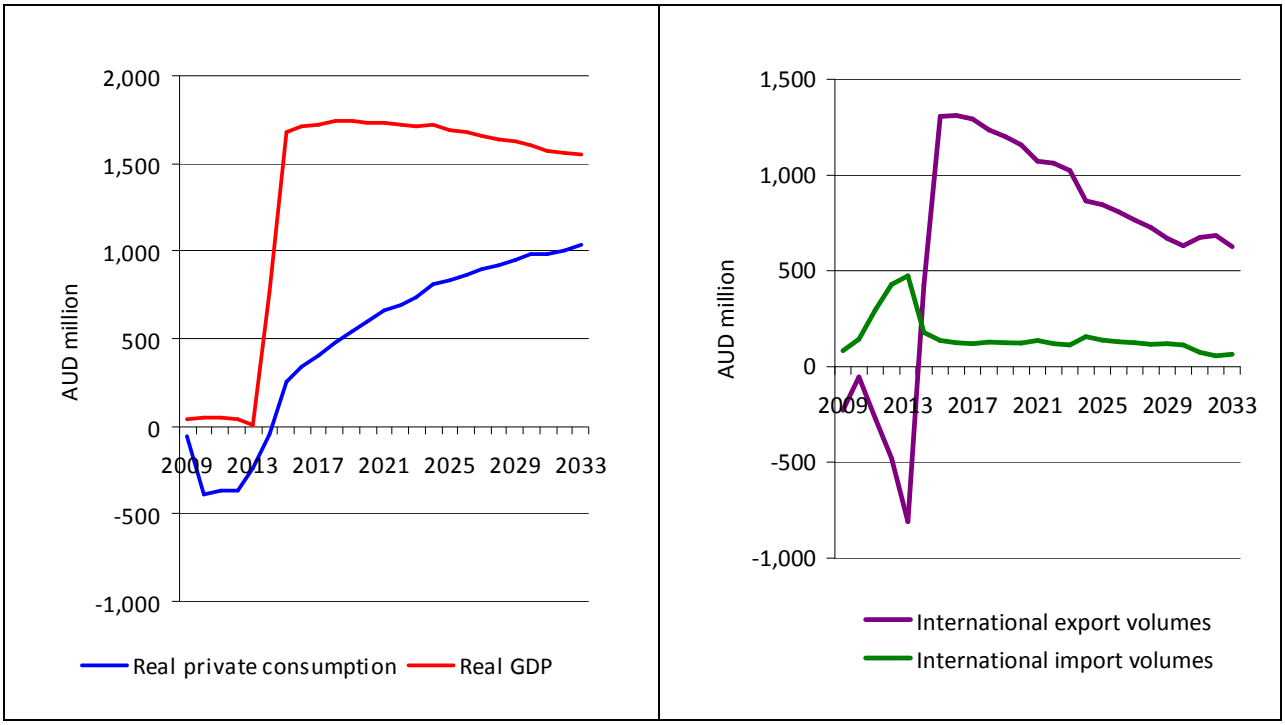


Figure 8.15.3 Impact on the Australian economy: 3 Mtpa (change compared to the base case scenario)

Economic Importance of the Project: Scenario 2

In summary, the impact on the Queensland economy of the 10 Mtpa project is estimated to be:

- Over the period 2009 to 2033, Queensland's real GSP is on average $4.1 billion or 1 % higher each year than in the base case scenario. In the period after 2022, when the project has reached production of 10 Mtpa, real GSP is almost $6.4 billion or 1.4 % higher than in the base case scenario.
- This increase in Queensland's real GSP is distributed to households throughout Australia, although Queenslanders benefit proportionately more than other Australians. The project contributes to an average annual increase in Queensland real private consumption spending over the period 2010 to 2033 of $540 million. This constitutes a 0.2 % increase over the base case scenario, which is significantly higher than the gain for Australia as a whole (of 0.1 %). In the period after 2022, the average annual increase in real private consumption spending is almost $1 billion a year (0.4 %) higher (see Figure 8.15.4).
- The project delivers important employment benefits to the Queensland economy and the project regions. On average, employment in Queensland is 4,300 per year higher on a full,-time equivalent basis. This exceeds the average annual employment of the project (the direct employment effect) across both the construction and operations phases of 3,196, demonstrating a significant employment multiplier effect. The employment effect is stronger after 2022, averaging almost 5,000 additional jobs.

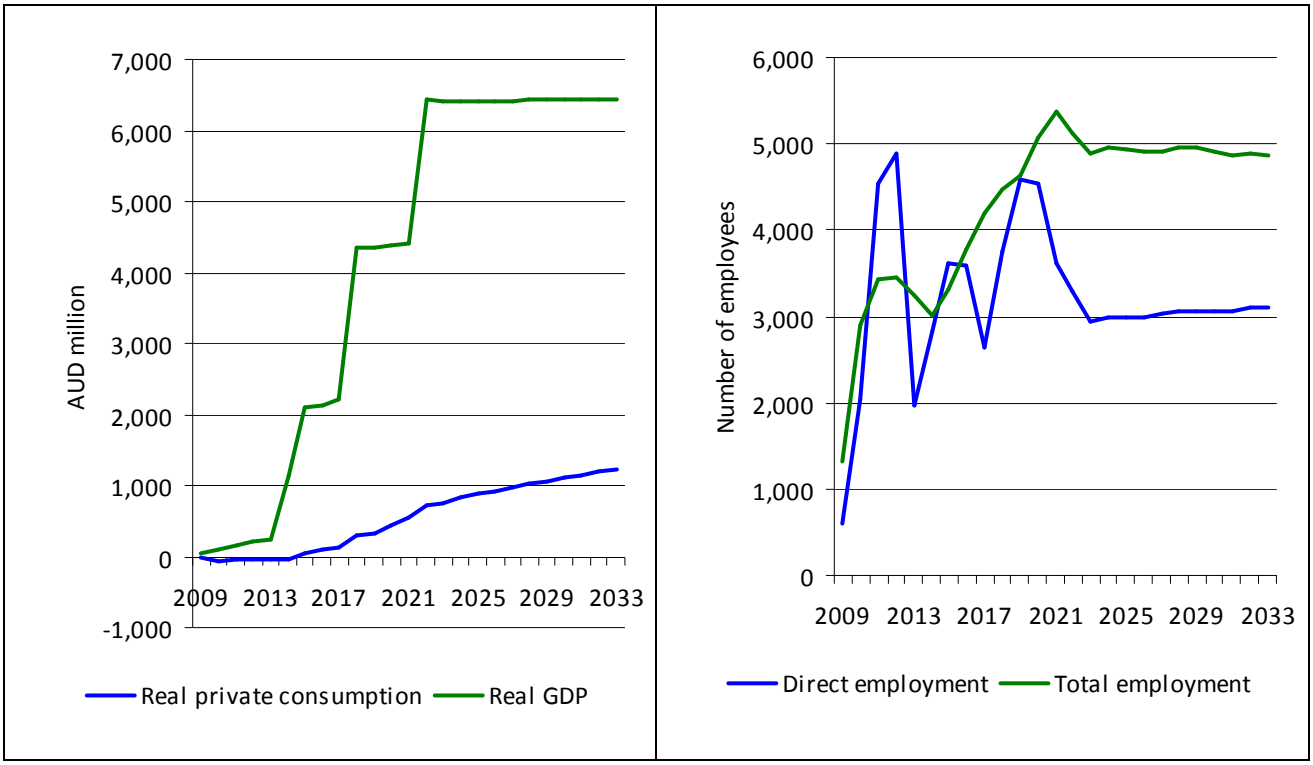


Figure 8.15.4 Impact on the Queensland economy: 10 Mtpa (change compared to the base case scenario)

The impact of the 10 Mtpa project on the Australian economy (including Queensland) is summarised as follows (see Figure 8.15.5):

- Real GDP is on average $3.5 billion a year higher than under the base case scenario, equivalent to about 0.2 % of real GDP per year. The project's contribution to real GDP peaks at $5.7 billion after achieving full capacity in 2022. This increment to real GDP has a discounted present value (using a 7 % real discount rate) of $29 billion. To place this in perspective, this discounted present value is equivalent to nearly 2.5 % of the level of Australia's GDP in 2007-08.
- The project makes a significant contribution to the welfare of Australia, as measured by the increase in real private consumption spending.[5] On average, real private consumption spending is $1.5 billion (or 0.1 %) higher as a result of the project.

[5] The discounted value of the increase in real private consumption expenditure over a period of time is an indicator of the increase in household disposable income. This is a more reliable indication of the benefit to Australian residents than the impact of a project on real GDP. Only part of the latter accrues to Australian residents, if the project is partly owned by foreign investors.

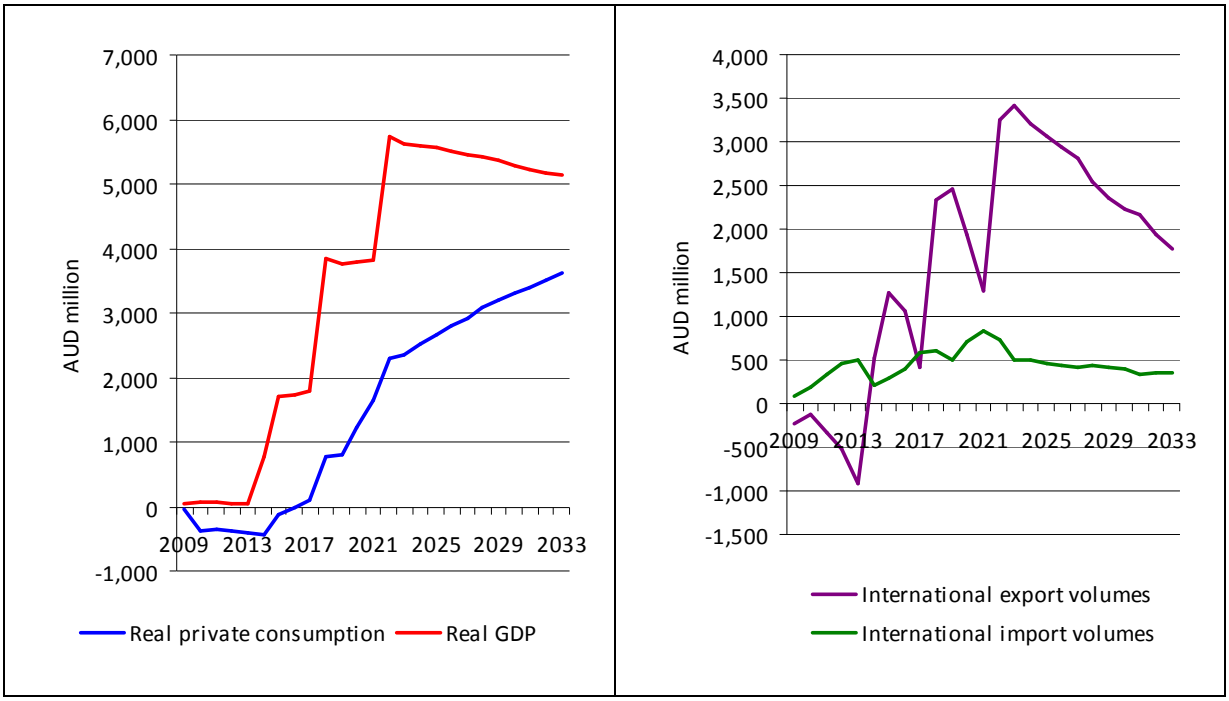


Figure 8.15.5 Impact on the Australian economy: 10 Mtpa (change compared to the base case scenario)

The project has a very high value-added as a proportion of its value of sales. This reflects the highly capital intensive nature of the components of the project (that is, capital expenditures are very high relative to annual operating expenditures). This means that the economic impact of the project through its purchases from and sales to other parts of the regional, Queensland and Australian economies is limited in comparison to a less capital intensive project that with the same value of sales. Australian households mainly benefit from an increase in income due to dividend payments to Australian shareholders and the substantial revenue payments made to the Queensland and Australian Governments in the form of royalty, company income tax and other tax payments, which are assumed to be recirculated through the economy.

Sensitivity Analysis

The economic impact assessment was based on a number of key assumptions. It was assumed that the construction of the LNG facility involved a 'stick build' approach, with implications for the local content assumption. Assumptions were made regarding future world LNG prices and construction and operating costs. These assumptions were subjected to an analysis to demonstrate the sensitivity of project viability and the economic benefits of the project to price and cost variations.

The LNG price assumption used in the economic impact assessment is reflective of prices prevailing during 2008 and the costs are early estimates. To take into account this uncertainty, a sensitivity analysis was conducted using the 3 Mtpa scenario described earlier as scenario 1. The variations in price and cost that were modelled are summarised by the shaded cells in the tables, below. The cost variation is applied across the board to all capital and operating costs. A real discount rate of 7 % has been used for calculating net present values.

Table 8.15.3 contains the sensitivity results in relation to the change in real private consumption for the Australian economy.

Table 8.15.3 Sensitivity ranges and results in terms of NPV of change in real private consumption for variations in price and cost: Australia

Price/cost AUD million	Low price (-50 %)	Base price	High price (+20 %)
Low cost (-20 %)		3,801	
Base cost	830	3,292	4,894
High cost (+50 %)		-1,271	

Table 8.15.4 contains the sensitivity results in relation to the net present value (NPV) change in Australian real GDP.

Table 8.15.4 Sensitivity ranges and results in terms of NPV of change in real GDP for variations in price and cost: Australia

Price/cost AUD million	Low price (-50 %)	Base price	High price (+20 %)
Low cost (-20 %)		12,596	
Base cost	8,067	12,311	14,880
High cost (+50 %)		10,664	

The results show that there is a considerable range of outcomes in terms of the contribution of the project to the Australian and Queensland economies reflecting market and cost uncertainties.

The project is assumed to be 30 % locally financed and 70 % foreign financed, an assumption with important implications for the share of real GDP created by the project that will go to Australians. Again, some sensitivity analysis was undertaken by varying these financing assumptions.

The sensitivity of the project's economic impacts was also tested with regard to variations in GHG emission permit prices and domestic and international policy settings. The central case was based on the Garnaut-25 emission permit price path and assumed that the project qualified for shielding at a rate of 60 % of its direct emissions. It was also assumed that an international emissions permit market will be fully developed by 2023. Under these assumptions, the impact of the emissions trading scheme and variations in permit prices was relatively small because world LNG prices will rise to reflect the higher costs associated with the purchase of emission permits. In the absence of an international permit market, the economic impact of the project will be significantly reduced as the project will be unable to pass on the higher cost to overseas customers. For example, in the latter case, the NPV of the increase in Australia's real GDP under scenario 2 (the 10 Mtpa project) was estimated to be $1.6 billion or about 6 % lower than under the central case policy scenario.

Source of Goods and Services

The regional economies in which the project is located are likely to benefit, on a per capita basis, to a greater extent from the project than the wider Queensland and Australian economies. Firstly, residents have the opportunity to share in the profits earned by the project to the extent that they are shareholders. Secondly, residents will also benefit from any increase in government spending or any reductions in State and national taxes that may be financed from project royalty and tax payments. In addition to this share of the above Australian economy-wide benefits, residents can be expected to benefit more than proportionately than residents of other areas of Australia from increased employment opportunities and opportunities to supply the project with goods and services.

The impacts of the project on the regions of Queensland in which it is located are significant. While project expenditures will vary from year to year, in an average year (including both construction and operating expenditures) the 10 Mtpa project is estimated to spend on a range of goods and services around $142 million in the gas transmission pipeline/CSG fields region and around $374 million in the

LNG facility region (see the figure next page). This involves a direct contribution to non-project regional GDP (that is GDP produced by industries other than the GLNG Project) of around $60 million per year for the gas transmission pipeline/CSG fields region and around $153 million a year for the LNG facility region.[6] In addition to this direct economic stimulus there is likely to be some indirect or flow-on increases in regional GDP.

The above estimates of local purchases are based on assumptions about sourcing of construction and operating inputs. The share of spend in each of the geographic regions will be subject to competitive tendering process – some of which is bid upon by international suppliers. At this early stage the project only has an indicative view on which suppliers will be used. All parts of the project of material value will be subject to competitive tendering.

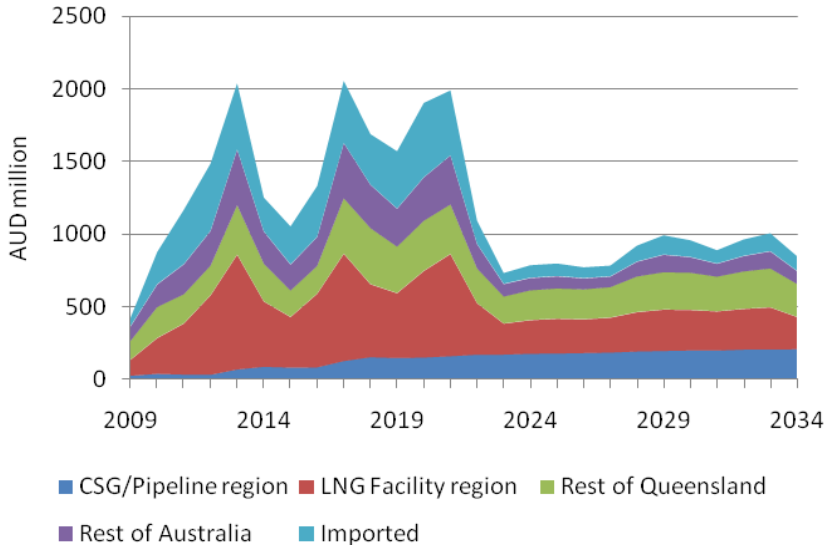


Figure 8.15.6 Expected average annual project expenditures (AUD million)

A potential economic benefit not captured by the model is the potential for new business to be established in the area. The model shows the purchases from industries that already exist in the region. Some project expenditures, currently paid to businesses outside the region, may be sufficiently large to justify the establishment of a local supplier. In effect, the project may provide some scope for regional 'import substitution' and economic diversification.

While the exact impact of the global recession on the Queensland and Australian economy is uncertain, to the extent that it involves reduced economic activity and a rise in unemployment, the project will at least partially offset such adverse impacts.

Short and Long Term Beneficial and Adverse Impacts

In the short term (the construction period from 2009 to 2014) the economic benefits of the project, as measured by the increase in real private consumption expenditure, are relatively modest. This is because the project is not producing and therefore not adding to GDP, while at the same time a portion of existing GDP is diverted from real private consumption spending towards financing the project's construction costs. This does not mean that real private consumption spending falls in absolute terms; rather it means

[6] This conversion from sales revenue to value added is based on the average ratio of value added to sales revenue for Australian industry derived from the 2004-05 national input output tables.

that real consumption spending falls relative to the base case scenario. In the longer term, after the project commences exporting and adding to real GDP, it contributes directly to increased household disposable income throughout Australia.

The economy's stock of productive resources (labour, capital and natural resources) grows over time as a result of population growth and capital accumulation. However at any point in time, the stock of resources is fixed from a national perspective. The project therefore competes for available resources with other industries in the economy. The large increase in exports associated with the project results in a slight appreciation of the real exchange rate, reducing the international competitiveness of other exporting and import competing projects. This applies to industries throughout the Australian economy, including businesses in the project area (such as farming, coal mining and alumina refining). As a result, the profitability of these businesses will fall to some extent. However, given the size of the project relative to the overall economy (the capital outlays of the project and the value of its sales are only a small fraction of Australia's real GDP), the impact on any one of these businesses will be very small. In net terms, this adverse impact on other businesses is outweighed by the benefits associated with the project, as indicated by the increase in real GDP.

The GLNG Project is unlikely to have a significant adverse impact on any existing businesses in the project region in terms of their sales volumes. This is because it is not directly competing with local business. In fact, the project will make significant purchases from local businesses in the project region.

Potential negative impacts of the project will arise if the project were to use a resource required by other businesses in the project area. For example, in the gas transmission pipeline/CSG fields region the project requires access to land that is currently used in agricultural production (predominantly grazing) and this reduces the amount of land available for agricultural purposes. In this case however, the amount of land taken up by the pipeline, CSG wells and ancillary facilities is very small relative to the overall area of land devoted to grazing and other agricultural activities. The direct impact on agricultural productivity is therefore likely to be negligible and, in any case, the project is required to pay compensation to landholders as part of the terms of access.

The project may also compete with existing businesses in the region for labour. This effect is mitigated by the fact that the project draws on a different skills mix to existing regional businesses and therefore will recruit a large proportion of its workforce from outside the region. It may also be mitigated by a weakening in regional labour demand and perhaps some increase in unemployment levels as the overall Australian economy weakens along with the slowdown in world economic activity.

Decommissioning Phase

The economic impact analysis did not consider the economic implications of decommissioning of the CSG field infrastructure, the pipeline or the LNG facility. The modelling was conducted over a period of 20 years from the commissioning of the first LNG train; however the project is likely to have a much longer life than this. The pipeline and the LNG facility will continue operation as long as gas is available and it is commercially viable to produce that gas. The CSG field developments will continue over the life of the project. This may involve shutting down some wells as their productivity falls, but new wells are likely to be continually developed in line with Santos' commercial objectives.

The economic importance of the project measured against baseline growth in the regional, state and national economies will decline over time, for example, the percentage contribution of the project to GDP and employment will fall over time as the rest of the economy grows. When the Project ceases to operate, the immediate impact would be a fall in GDP and employment, but this would be very small relative to total state and national GDP and employment. At a regional level the impact would also be relatively minor as the regional economies would have grown, offering a wider range of alternative employment and business opportunities. After the closure of the project, resources would be allocated to other activities. After a transition period, it is likely that almost all workers would find alternative employment. The length of the transition period would depend on the strength of economic activity at the time of closure.

Project closure would be anticipated a number of years in advance. This would provide the opportunity for the project, its employees and its suppliers to develop adjustment plans so as to minimise the impact of the transition to new activities.

The Need for Additional Infrastructure

To a large extent the LNG Project will be self-reliant for infrastructure provision. For example, it will provide its own port facilities as well as its own water supply and sewerage facilities and, most likely generate its own power. However, the GLNG Project will be reliant on some common-user infrastructure including the potential access road and bridge, and the shipping channels in Port Curtis. These infrastructure items will be available for use by others and the means of funding and delivering common user infrastructure has yet to be determined.

The analysis of the project's traffic impacts on the existing road network has been summarised in Section 4.14.3. This includes information regarding the implications for upgrading various existing road sections and intersections. While Santos will contribute to the cost of works associated with the GLNG Project, additional funding may be required to complete the necessary upgrades.

Santos will enter into discussions with the Queensland Government and the Gladstone Regional Council regarding infrastructure required for the project.

Implications for Future Development in the Locality

The LNG facility site is located in the Curtis Island Industry Precinct of the Gladstone State Development Area Development Scheme. This area has been identified as being suitable for the development of LNG facilities and associated infrastructure. Establishment of the GLNG Project on this site could facilitate the establishment of other similar LNG projects in the locality and the provision of common user infrastructure.

Further assessment of the implications of the project for existing land uses and industry in the region is given in Section 8.11.5.

8.15.5.2 Labour Market Impacts

The project requires labour for both the construction and operational stages.

Scenario 1 and 2

Construction Phase

The LNG facility has a large construction workforce requirement.[7] The sequential construction of the three LNG trains under Scenario 2 involves a wave like pattern of construction employment in Gladstone (see Figure 8.15.7). During the construction of the first train and ancillary facilities and infrastructure, a peak construction workforce of around 3,000 will be required. The construction of the second and third trains also involves a fluctuating construction workforce, although with a lesser number of peak period employees. Given the numbers and the skills required, around 65 % of the construction workforce will most likely be sourced from outside the Gladstone region. This peak workforce is large relative to the population of the Gladstone region. The peak of almost 3,000 will be equal to around 7 % of the size of the existing employed workforce in the region.

Information has been gathered on the required occupational or skills composition of the GLNG construction workforce for the peak construction workforce of 3,000 relative to the existing composition of the Facility and the gas transmission pipeline/CSG fields region workforce. The construction workforce

[7] These estimates relate to a 'stick build' construction option. If a modular option were to be adopted, the construction numbers would be somewhat less.

will have a high proportion of professional and supervisory (25 %) and skilled employees (49 %) and a relatively low proportion of semi-skilled and unskilled employees (26 %). In 2006, the Department of Employment and Workplace Relations conducted a regional skills survey in Gladstone. The survey indicated that the greatest skills shortages were in the areas of professional and skilled trades. The gas transmission pipeline/CSG fields region also has a relatively low proportion of professional and skilled employees in its workforce.

The occupational/skills composition of the construction workforce compared to the availability of skilled and professional employees in the region tends to limit project employment opportunities for employees currently residing in the region.

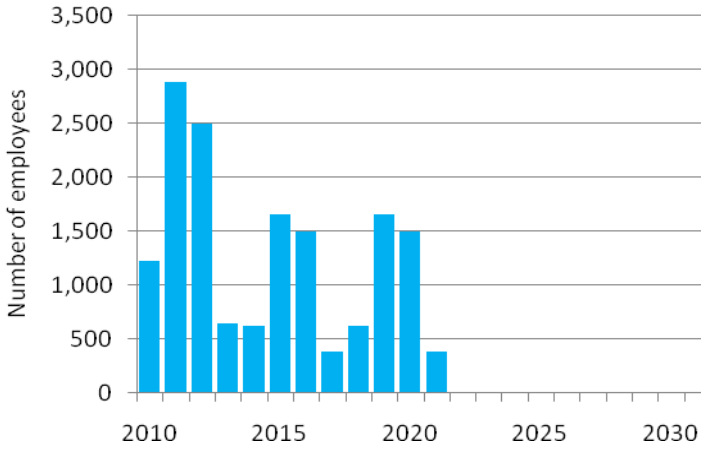


Figure 8.15.7 Estimated LNG Facility construction workforce (10 Mtpa)

Operational Phase

The operational workforce is described as follows:

- The LNG facility workforce will, at 10 Mtpa production, have a full time labour force of approximately 250 people (consisting of 160 for plant operations (40 employees at a time and four shifts), 50 for plant maintenance and 40 for technical and administrative support). At 3 Mtpa production, the Facility will have a smaller workforce of approximately 140 people; and
- The LNG facility operational workforce is likely to be a workforce that mostly (almost 100 %) resides in Gladstone and is recruited either from the Gladstone area, other parts of Australia or overseas depending on availability and qualifications for positions. The labour demand for the operation of the LNG facility is small relative to the size of the local and wider Queensland labour markets and is therefore unlikely to contribute to any local labour market pressures.

Prior to the slow down in world and Australian economic activity, the large number of projects either under construction or under consideration in the Gladstone region, held the prospect of strong labour market pressures in Gladstone given the size of the required construction workforce relative to the region's existing workforce. While the impact of the global slowdown on construction activity in Queensland is not yet clear, it is likely that a number of projects currently under study will be delayed or even abandoned. As a result, the impact of the GLNG Project on regional labour markets is likely to more moderate. It may well be the case that the project's demand for construction employees may partially offset the impact of the economic slow down on the region's labour market, helping to maintain employment levels over the next few years.

The number of operational employees required for the LNG facility region over time is described in Figure 8.15.8.

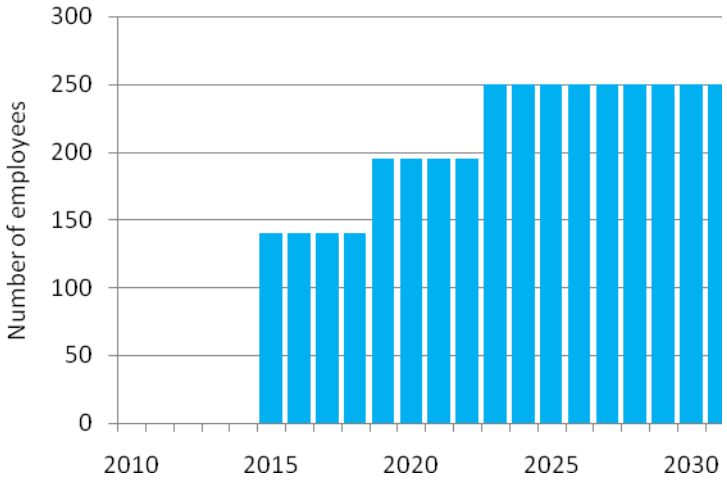


Figure 8.15.8 Estimated LNG Facility operational workforce (10 Mtpa)

Cumulative Construction Workforce

In addition to the GLNG Project, there are a number of large construction projects in the region, mainly in Gladstone, during the construction period for the first phase of the GLNG Project. The cumulative construction labour demands of these projects are illustrated in Figure 8.15.9[8]. The cumulative construction workforce varies substantially over the period with a peak in early 2012 of over 6,500. This requirement is very large relative to the existing Gladstone workforce and it is likely that many of these construction employees will be sourced from outside the region.

A number of proposed projects are not included in the figure. For example, the construction workforce for the proposed Origin and ConocoPhillips LNG facility is still to be announced. Since this is a large project and construction is to occur over the period 2010 to 2014, the cumulative construction workforce may be significantly larger than that indicated in Figure 8.15.9.

In practice, the time profile of construction employment will be somewhat smoother than this if the various projects employ some of the construction employees from other projects as these projects are completed. For example, prior to the commencement of construction of the LNG facility, there is already anticipated to be a large construction workforce in the region associated with earlier scheduled projects. There may be scope to recruit some of these employees to the GLNG Project's construction workforce.

The impact of the GLNG Project on regional labour markets and, to a lesser extent, the economic impact of the project on the regional, Queensland and Australian economies, depends on the economic conditions prevailing in these economies, particularly during the construction phase of the LNG facility, from 2010 to 2014. Currently, there are a large number of projects under consideration for construction in the Gladstone region. If all of these projects were to proceed, there will be a substantial cumulative impact on the regional labour market as the combined construction workforce required for these projects is very large relative to the size of the regional labour market. This will mean the importation of a large amount of labour into the Gladstone region with consequent pressures on local infrastructure and services.

[8] Only those projects for which there was employment data published at the time of writing were included.

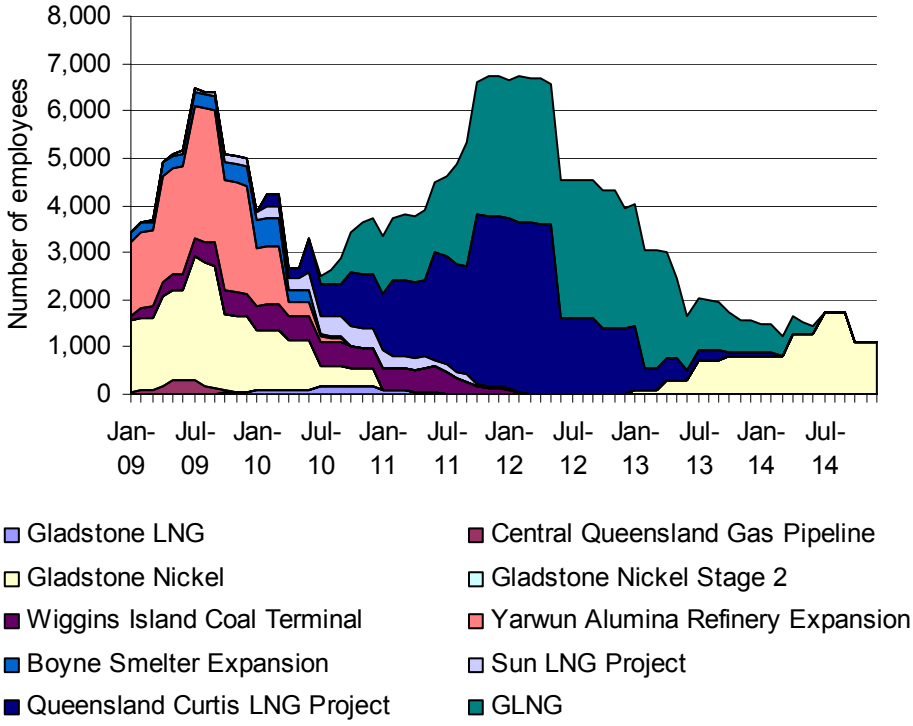


Figure 8.15.9 Estimated cumulative construction workforce requirement (Gladstone region)

The worsening of the downturn on world economic activity has significant implications for the level of economic activity and labour demand in the GLNG facility region. The slowdown in demand will impact on businesses in the region and is expected to result in some increase in unemployment levels as local businesses reduce their labour demands. While there have been no announcements thus far, the uncertainty surrounding economic conditions in the next few years may cause some project proponents to delay or even abandon planned projects. This will contribute to a reduction in demand for construction employees over the next few years.

If this is the case, the impact of the GLNG labour demand on the local labour market may be lessened. Moreover, the construction of the GLNG Project, commencing in 2010, may act to stimulate local economic activity. Given the increased availability of local labour, the project may be able to locally source a higher proportion of its construction workforce locally. Therefore the project could play an important role in offsetting the impact of the global slowdown on regional unemployment.

8.15.5.3 Mitigation Measures

The mitigation measures can be summarised as:

- The potential impact from the GLNG Project on commercial fisheries within Port Curtis is considered to be minimal and is discussed in further detail in Sections 8.4.5.3.
- The direct impact on the tourism industry, in the context of accommodation occupancy rates, is likely to be positive and as such is not likely to require mitigation.
- The potential impact from the GLNG Project on recreational fisheries is equivalent to the impact on commercial fisheries, given that both use the same marine environment (see Section 8.4.5.3).
- The impact of the project on the region's labour markets will be mitigated by the sourcing of construction labour from outside the region, combined with a potential reduction in regional labour demand as a result of the slowdown in economic activity.

- The project's impact on GHG emissions is assumed to be mitigated by its requirements to purchase permits under the Carbon Pollution Reduction Scheme.

The need for additional infrastructure provision by the government is limited. The most significant additional infrastructure requirements for the project will be located at the Port of Gladstone and these could be paid for in full or in part by the GLNG Project. It is not envisaged that the project will draw on the electricity grid. The project's demand on State provided transport infrastructure (e.g. roads and rail) is discussed in Section 4.

Table 8.15.5 provides a summary of potential economic impacts and mitigation measures for the LNG facility.

Table 8.15.5 Potential Economic Impacts and Mitigation Measures

Aspect	Potential Impact	Mitigation Measures	Objective
Construction			
Commercial fisheries	Disturbance to and reduction of marine fish habitat.	Adhere to proposed environmental mitigation measures.	To ensure local commercial fisheries operations are not negatively impacted by construction activities.
Recreational fisheries	Disturbance to and reduction of marine fish habitat.	Adhere to proposed environmental mitigation measures.	To ensure local recreational fisheries operations are not negatively impacted by construction activities.
GHG emissions (construction and operation)	The construction and operation of the CSG gas fields, transmission pipeline and facility will involve the creation of GHG emissions.	Adhere to requirements under the Carbon Pollution Reduction Scheme.	To ensure that the project's responsibilities for GHG emissions are addressed.

8.15.6 Summary of Findings

This section has reported on an assessment of the impact of the GLNG Project on the regional labour market and on the regional, Queensland and Australian economies. The estimated project benefits in terms of gross domestic product and household consumption spending (a measure of household welfare) are substantial, particularly in the case of (the 10 Mtpa LNG facility. A sensitivity analysis has demonstrated that uncertainty concerning future price and cost paths and GHG policy settings has significant implications for the viability of the project and the magnitude of the economic impact and benefits.

If all projects planned for the Gladstone region were to proceed, the construction of the LNG facility will coincide with a period of extremely tight labour market conditions in the Gladstone region. The project will need to bring in most of its construction workforce from outside the region, adding to the demands placed on regional infrastructure and services. However, the economic outlook suggests that there will be a slowdown in economic activity in Gladstone and that a number of planned projects may be deferred or not proceed at all. Therefore, recent economic developments have made it more likely that construction of the GLNG facility will coincide with a period of weak labour demand. The project's labour demands could therefore be met, to a greater extent, from local labour supply. Rather than contributing to 'overheating' in the regional labour market, the project could perform an important counter cyclical function by providing a source of new jobs at a time of rising unemployment levels.